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DIAMONDHEAD
MISSISSIPPI

DRAINAGE UPDATE 11/10/2021

Michael Reso
City Manager

Nancy Depreo
Mayor

Gerard Maher
Councilmember-At-Large

Shane Finley
Councilmember - Ward 1

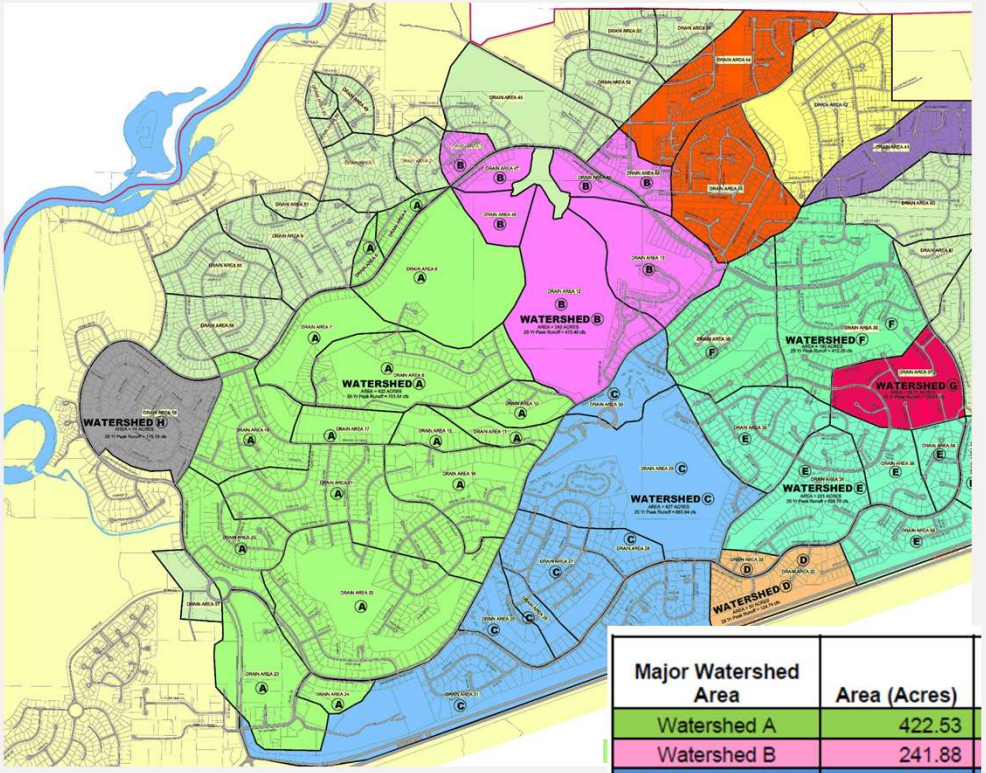
Alan Moran
Councilmember - Ward 2

Ricky Sheppard
Councilmember - Ward 3

Charles S. "Chuck" Clark
Councilmember - Ward 4

DIAMONDHEAD DRAINAGE

DIAMONDHEAD DRAINAGE



Major Watershed Area	Area (Acres)
Watershed A	422.53
Watershed B	241.88
Watershed C	427.39
Watershed D	49.98
Watershed E	220.70
Watershed F	190.00
Watershed G	51.70
Watershed H	73.65

Major Outfall Study - 2014

62 Small drainage sub-basins
8 Drainage basins

Over 850,000 LF Ditches

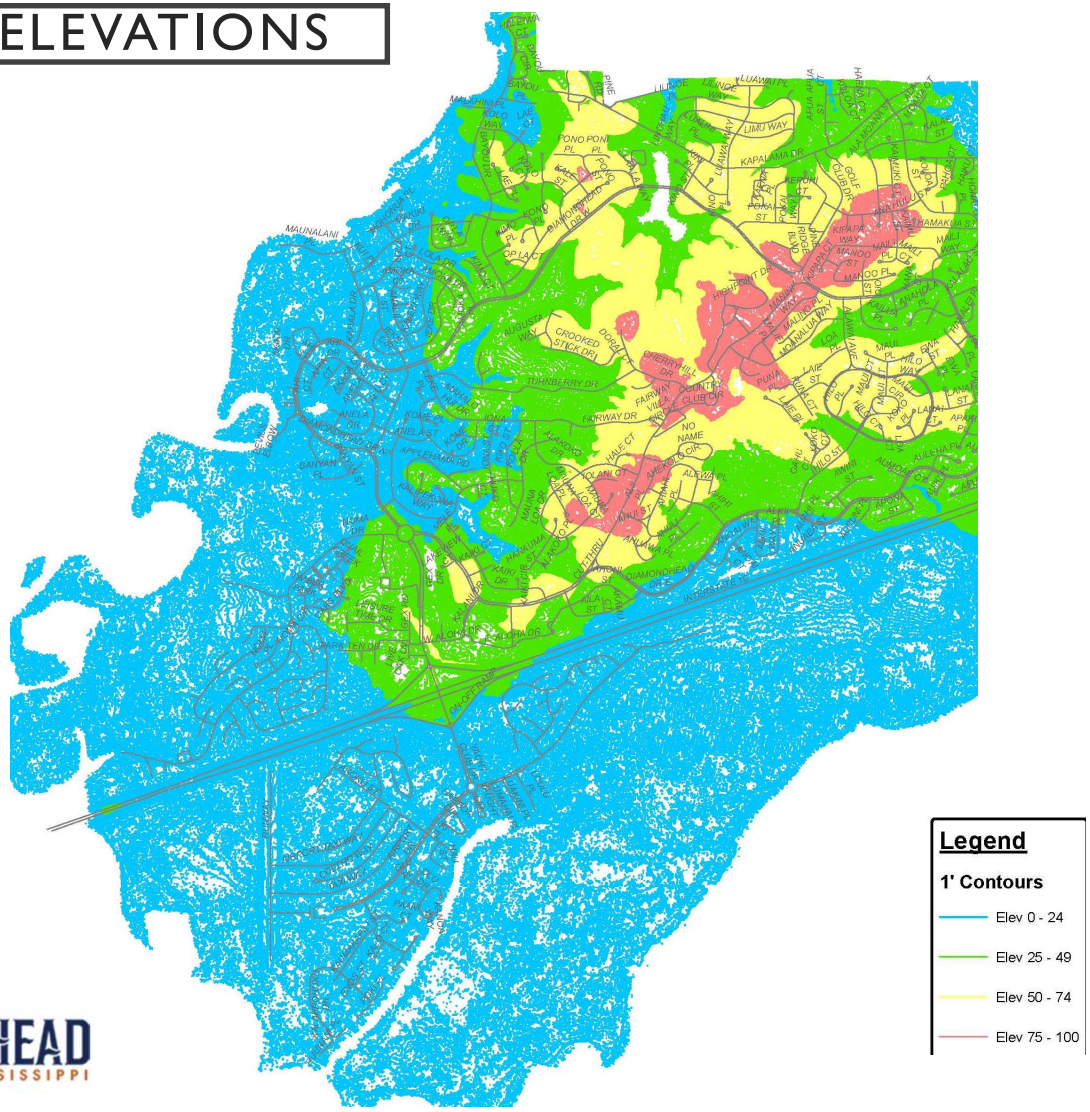
6400 Culverts - 2014

Elevations 0-100

24 Retention Ponds

DIAMONDHEAD DRAINAGE ELEVATIONS

DIAMONDHEAD ELEVATIONS
ELEV. 0 - ELEV. 100



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DIAMONDHEAD DRAINAGE

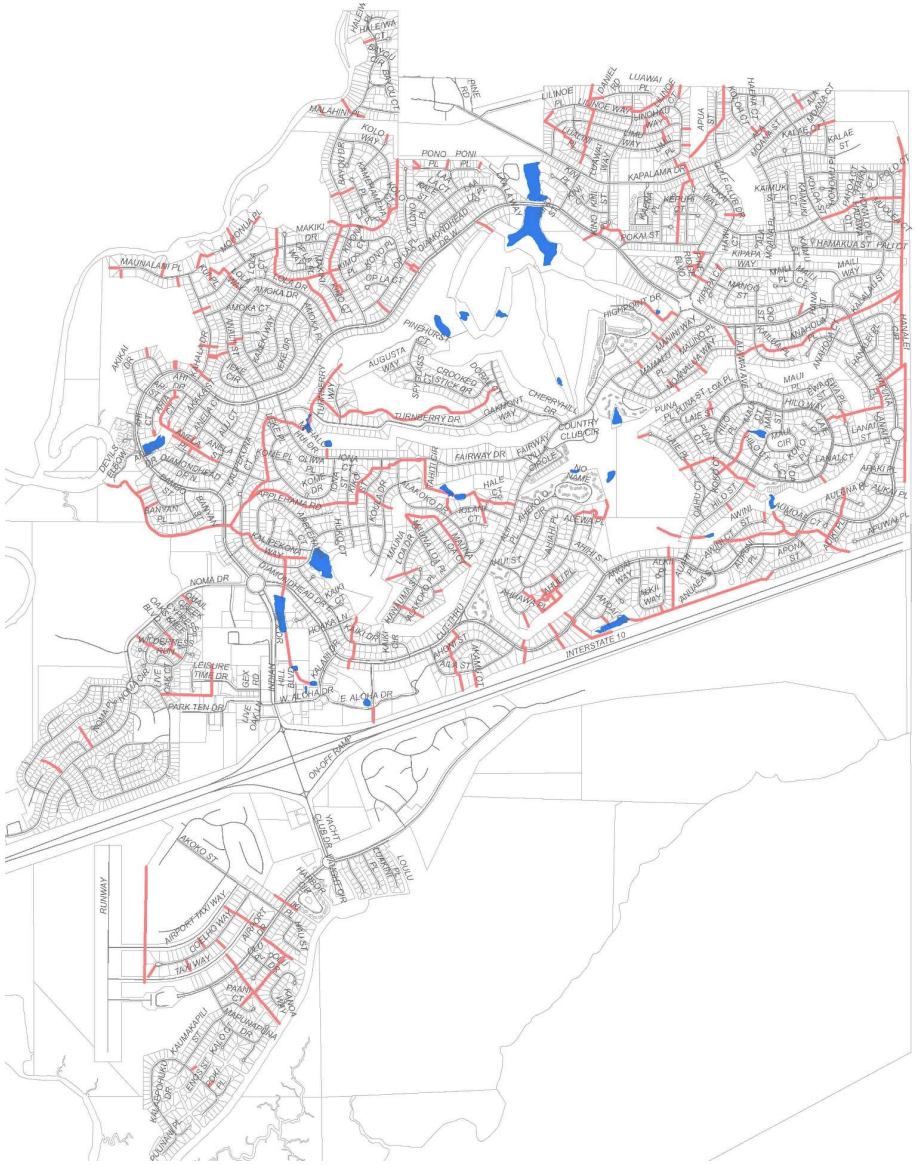
RETENTION PONDS – LARGE OUTFALL DITCHES

Retention ponds

Store rainfall runoff from streets and adjacent lands

Are an efficient and cost-effective land drainage system, because fewer and smaller pipes can be used to carry runoff to the rivers

Benefit our environment by acting as a natural filter - they help to remove sediment and chemicals before the water drains to our rivers



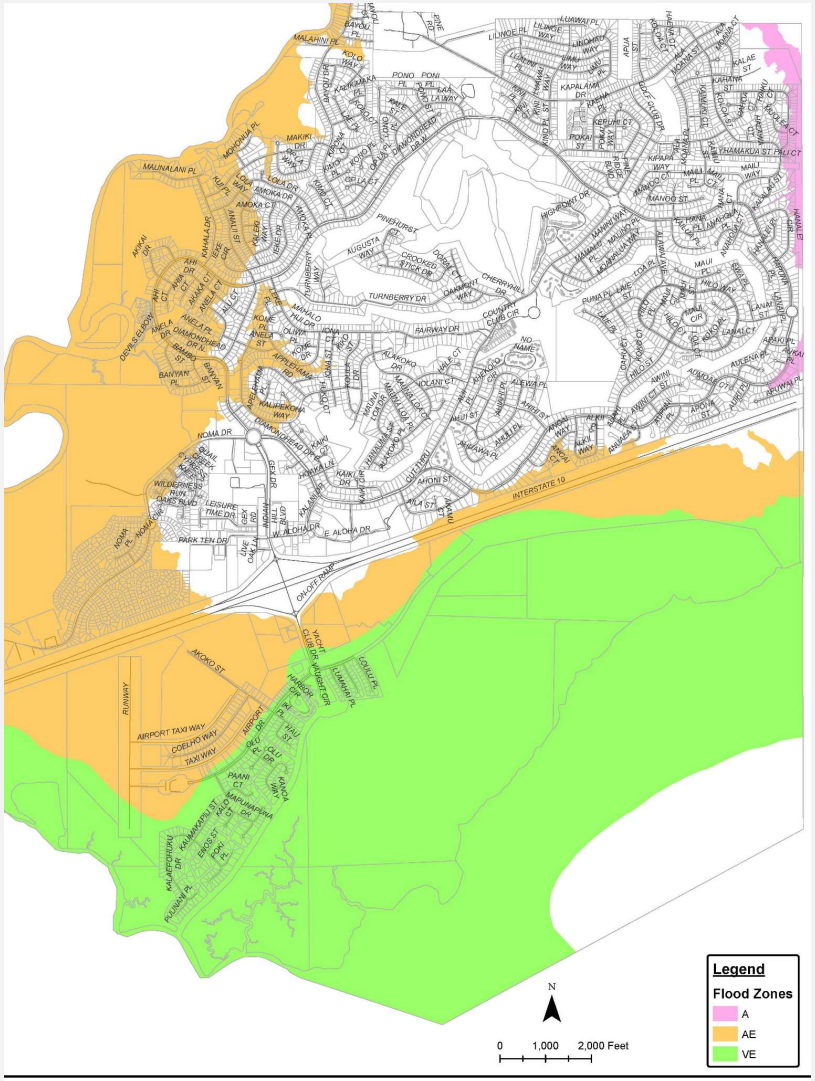
FLOOD ZONES

Zone A

Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

AE - The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones

V Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. No base flood elevations are shown within these zones



FLOODING

Inundation

Coastal storms and related surge-related flood events are happening more frequently, as is tidally influenced flooding. Heavy rain also seems to be playing a bigger role.

Three primary causes: rainfall runoff, river flooding, and coastal flooding

•**Rainfall Runoff** occurs from a precipitation event, and a heavy event (defined by high rainfall rates) can overwhelm a stormwater management system, causing water to inundate roads and property.

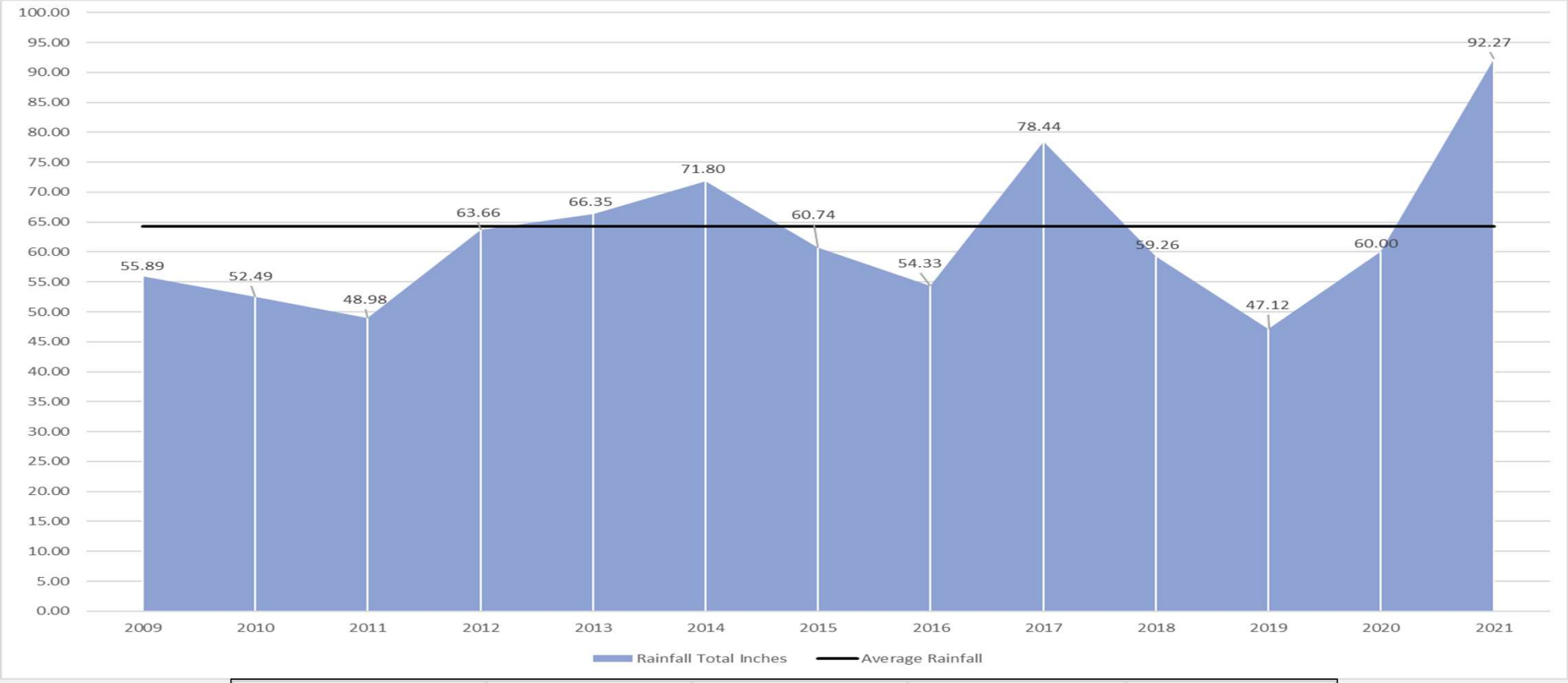
•**River flooding** primarily results from an extended precipitation event that occurs at, or upstream from, the affected area. River flooding can also occur when traditional flood-control structures, such as levees and dikes, are overtopped. Significant river flooding events in many coastal areas are often the result of tropical cyclones, such as Hurricane Floyd (1999) or Hurricane Harvey (2017).

•**Coastal flooding** occurs in areas directly adjacent to coastal waters. There are several distinct causes:

•high tide – low lying areas

•storm surge – as a result of hurricanes

2021 RAINFALL
NEW AVERAGE OR UNUSUAL YEAR



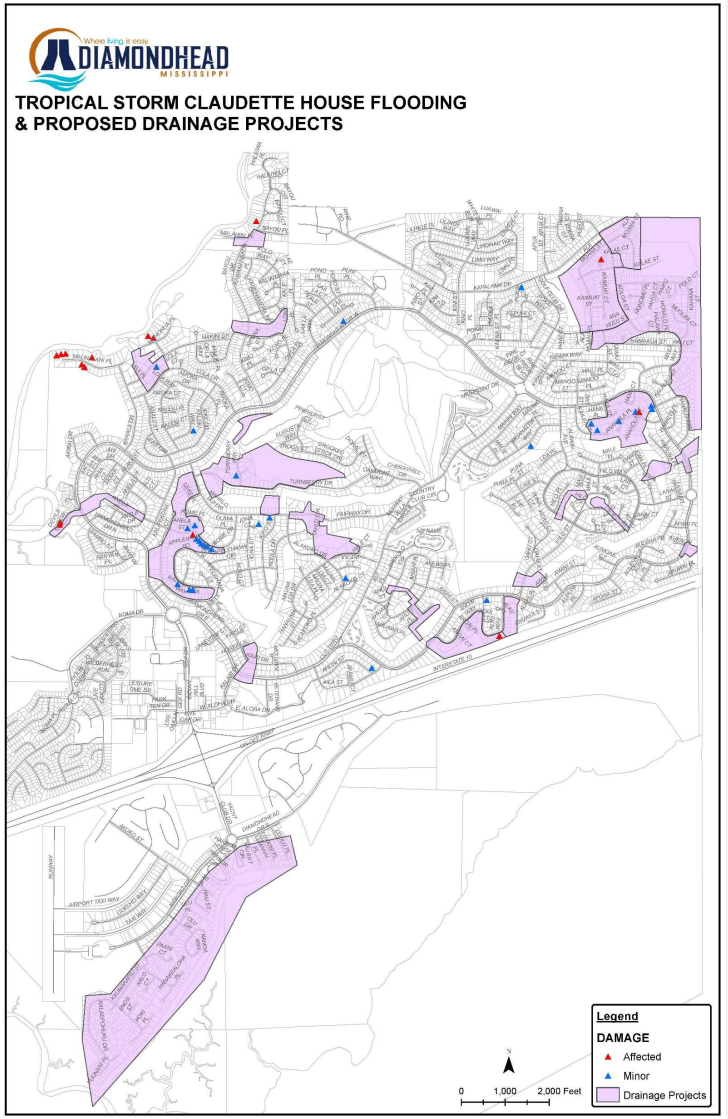
Area	Rainfall (inches)	Total gallons	Cubic Feet	40 gallon baths
10.11 square miles	100	17,569,724,160	2,348,896,423	439,243,104
10.11 square miles	60	10,541,834,496	1,409,337,853	263,545,862

FLOODED STREETS AND HOMES

- Damage Self Report (crisistrack.com)

- Federal Emergency Management Agency FEMA

- Mississippi Emergency Management Agency MEMA




ACTION

ACTION PLAN

- **Hydraulic Analysis** for the entire City – Basin A is underway
- **Stormwater Management** - modifications of existing stormwater practice, additional enforcement and penalties, implementing land development policies and regulations that align community growth and development with stormwater management goals
- **Floodplain Management** - flood risk reduction goals, ordinance requirements, codes - National Flood Insurance Program's Community Rating System CRS – Rostan
- **Land Use Planning** - networks of natural landscapes and low impact developments can lower the amount of runoff and thus reduce dependence on built infrastructure to manage stormwater. Emphasize the protection and restoration of coastal wetland landscapes, which absorb excess water, can provide flood protection benefits. Orion Planning East Aloha – Elliot's Model Homes
- **Public Works** - Public works personnel are critical to the operation and maintenance of key components of the stormwater management system. Public works personnel construct and maintain stormwater system. They are in a good position to observe asset performance and identify repairs that are needed. Report to City Engineer to provide a solution.
- **Identify and Prioritize Drainage Projects** – Prioritize projects and seek funding - match the right funding with the right project. Have a realistic plan that our Federal and State Officials understand to assist with funding. Get moving and don't stop until all projects have been funded. Pickering Engineering
- Identify – Prioritize - Seek Funding

ACTION PLAN STEPS COMMUNITY INVOLVEMENT

Public Meetings - resident's input

How do I report a drainage problem?

https://diamondhead.ms.gov/publicworks/webform/report-drainage-problem

STEPS TAKEN BY CITY

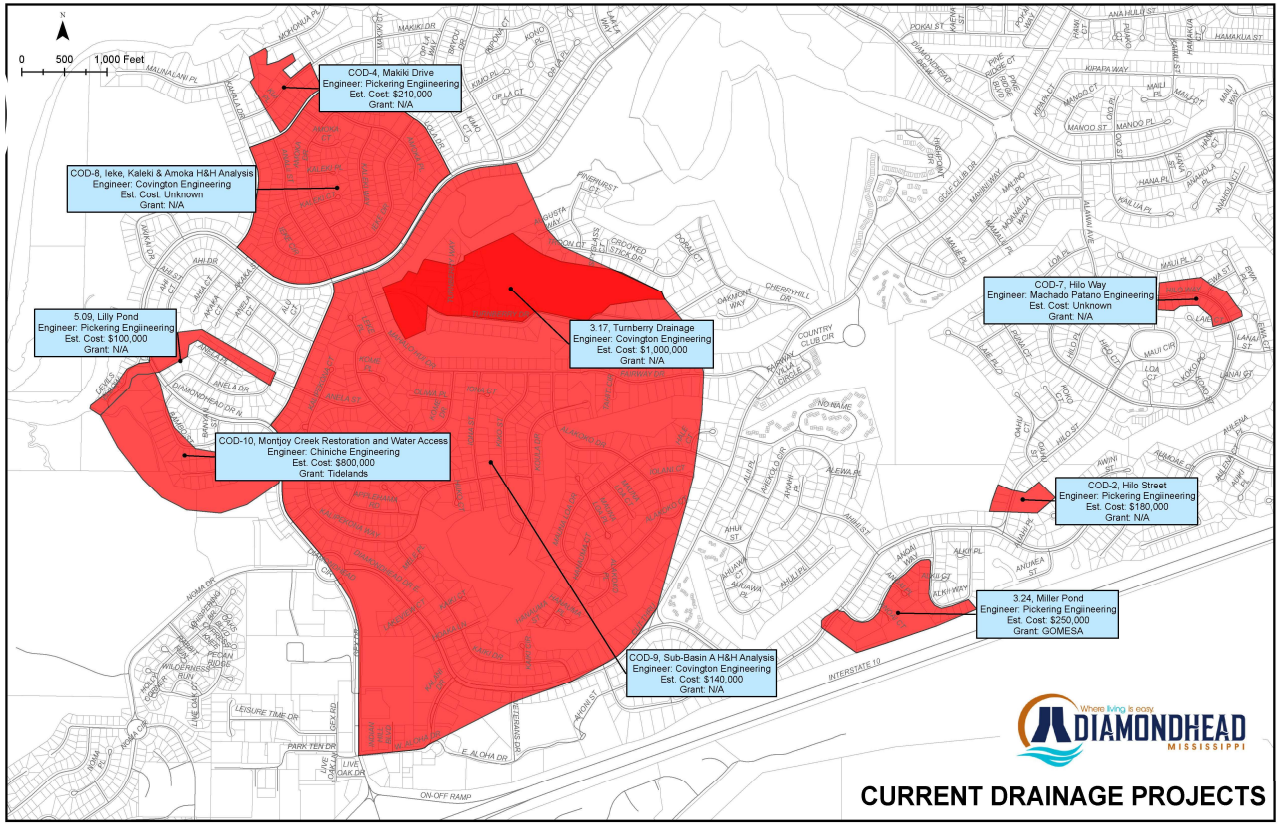
- City Engineer
- Net fill policy
- Landscape culvert moratorium
- Maintenance - Cleaning ditches and checking outfall ditches
- Drainage designed for100 year event
- Bayou Acquisition
- Increased Building Department Staff
- Purchased land to use as green space and detention
- Subdivision Regulations Ordinance Approved by council
- Participated in the Hancock County Watershed-Based Stormwater Assessment & Management Plan in 2015 to identify drainage problem areas in the city
- Pervious pavement
- Rotten Bayou Watershed

- Joint venture with Hancock County Board of Supervisors matching funds $2,000,000 – City $2,000,000 - $4,000,000 total
- GOMESA grant for $495K for drainage and water quality project.
- NRCS Grant - Alkii Way Drainage ditch improvements for $350K
- Disaster Management Firm - Rostan Solutions consultant for hazardous mitigation funding
- Hired Pickering Engineering to help city with funding from Federal and State Funding Sources
- National Flood Insurance Program's Community Rating System CRS – Rostan

PREVIOUS STEPS TAKEN DRAINAGE PROJECTS

- Diamondhead Drive West Drainage improvement
- Diamondhead Drive East Drainage
- Turnberry Drainage Weir Improvements
- Drainage improvements Amoka Place/Ieke
- Duck Pond Culvert Replacement
- Engineer SVS Ieke Drive Drainage
- Kome Drive Drainage Project
- Drainage Project Live Oak Phase II
- Culvert Replacement Airport Drive
- Kiko / Iona Street Drainage
- Kapalama Street
- Remove and Replace Culvert Bayou Drive
- Dainage Improvements D'Head Dr. East
- City Hall Drainage Improvements
- Diamondhead Drive East, Ahekolo Circle, Bayou Drive & Kapalama
- Makiki Drainage
- Bamboo Drainage
- Alkii Way Bank Stabilization Project

CURRENT DRAINAGE PROJECTS



CURRENT DRAINAGE PROJECTS
$2.6 MILLION IN PROJECTS
NOT INCLUDING COD7, COD8 & COD9

Makiki

a. Name of Project: Makiki (COD-4)
b. Engineer on project: Pickering Engineering
c. Estimate Cost of Project, if available: $210,000
d. Grant, if received for project: N/A

Miller Pond

a. Name of Project: Miller Pond (3.24)
b. Engineer on project: Pickering Engineering
c. Estimate Cost of Project, if available: $250,000
d. Grant, if received for project: GOMESA

Lilly Pond (5.09)

a. Name of Project: Miller Pond (3.24)
b. Engineer on project: Pickering Engineering
c. Estimate Cost of Project, if available: $100,000
d. Grant, if received for project: N/A

Hilo Street (COD-2)

a. Name of Project: Hilo Street (COD-2)
b. Engineer on project: Pickering Engineering
c. Estimate Cost of Project, if available: $180,000
d. Grant, if received for project: N/A

Hilo Way (COD-7)

a. Name of Project: Hilo Way (COD-7)
b. Engineer on project: Machado Patano Engineering
c. Estimate Cost of Project, if available: Unknown
d. Grant, if received for project: N/A

Turnberry Drainage (3.1

a. Name of Project: Turnberry Drainage (3.17)
b. Engineer on project: Covington Engineering
c. Estimate Cost of Project, if available: $1,000,000
d. Grant, if received for project: N/A

Ieke, Kaleki and Amoka Analysis (COD-8)

a. Name of Project: Ieke, Kaleki and Amoka H&H Analysis (COD-8)
b. Engineer on project: Covington Engineering
c. Estimate Cost of Project, if available: Unknown
d. Grant, if received for project: N/A

Sub-basin A Analysis (COD-9)

a. Name of Project: Sub-basin A H&H analysis (COD-9)
b. Engineer on project: Covington Engineering
c. Estimate Cost of Project, if available: $140,000
d. Grant, if received for project: N/A

Montjoy Creek Restoration and Water Access

a. Name of Project: Montjoy Creek Restoration and Water Access
b. Engineer on project: Chinichi Engineering
c. Estimate Cost of Project, if available: $800,000
d. Grant, if received for project: Tidelands

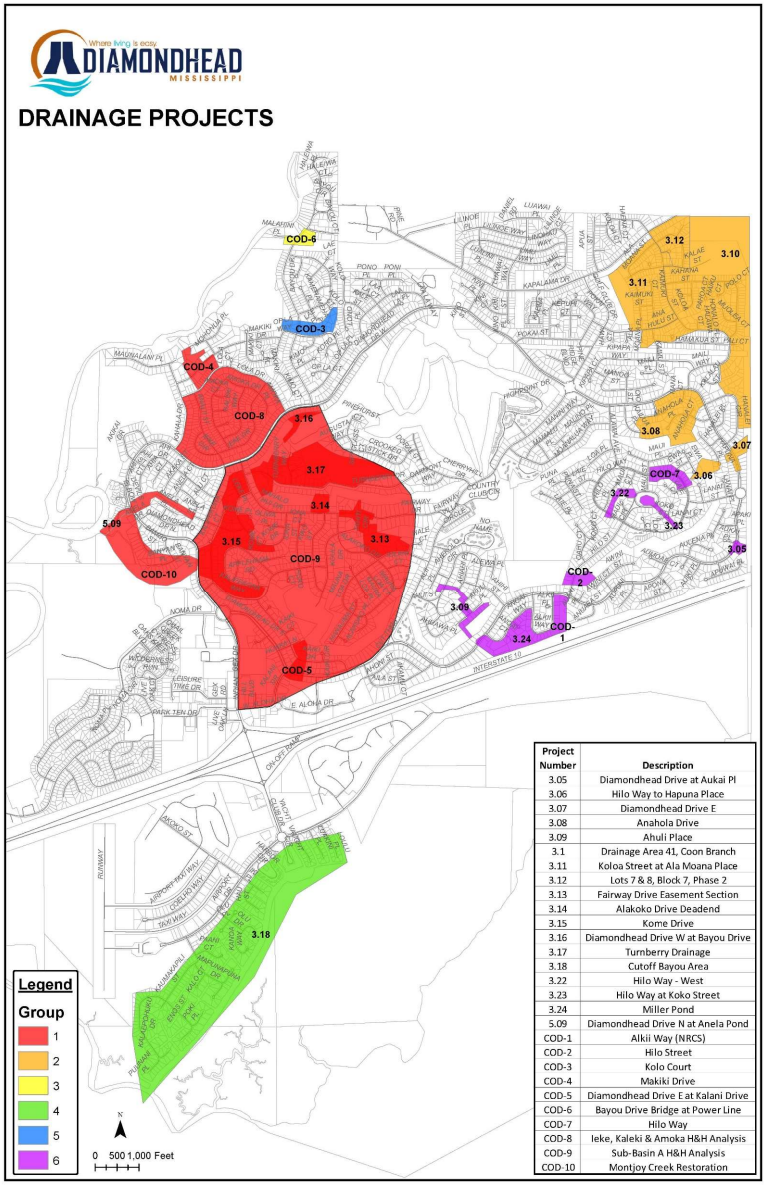
Beaux Vue

a. Name of Project: Beaux Vue
b. Engineer on project: Digital Engineering
c. Estimate Cost of Project, if available: N/A
d. Grant, if received for project: N/A

PROPOSED DRAINAGE PROJECTS

POTENTIAL FUNDING SOURCES

State Issued Bonds
RESTORE
GOMESSA
Tidelands
NRCS
MDA
EDA
Municipal General Obligation Bond
Pat Harrison Water District
WRDA
NRCS EWP
MDEQ
FEMA/MEMA HMGP
Conservation Network
MS Coastal Improvement Programs
USDA
NRCS PL 566
EPA



Project Number	Description
3.05	Diamondhead Drive at Aukai Pl
3.06	Hilo Way to Hapuna Place
3.07	Diamondhead Drive E
3.08	Anahola Drive
3.09	Ahuli Place
3.1	Drainage Area 41, Coon Branch
3.11	Koloa Street at Ala Moana Place
3.12	Lots 7 & 8, Block 7, Phase 2
3.13	Fairway Drive Easement Section
3.14	Alakoko Drive Deadend
3.15	Kome Drive
3.16	Diamondhead Drive W at Bayou Drive
3.17	Turnberry Drainage
3.18	Cutoff Bayou Area
3.22	Hilo Way - West
3.23	Hilo Way at Koko Street
3.24	Miller Pond
5.09	Diamondhead Drive N at Anela Pond
COD-1	Alkii Way (NRCS)
COD-2	Hilo Street
COD-3	Kolo Court
COD-4	Makiki Drive
COD-5	Diamondhead Drive E at Kalani Drive
COD-6	Bayou Drive Bridge at Power Line
COD-7	Hilo Way
COD-8	Ieke, Kaleki & Amoka H&H Analysis
COD-9	Sub-Basin A H&H Analysis
COD-10	Montjoy Creek Restoration

ENGINEERING FIRMS
ENGAGE – ASK – ASSIST

Makiki
Engineer on project: Pickering Engineering

Miller Pond
Engineer on project: Pickering Engineering

Lilly Pond (5.09)
Engineer on project: Pickering Engineering

Hilo Street (COD-2)
Engineer on project: Pickering Engineering

Hilo Way (COD-7)
Engineer on project: Machado Patano Engineering

Turnberry Drainage (3.17)
Engineer on project: Covington Engineering

Ieke, Kaleki and Amoka H&H Analysis (COD-8)
Engineer on project: Covington Engineering

Sub-basin A H&H analysis (COD-9)
Engineer on project: Covington Engineering

Montjoy Creek Restoration and Water Access
Engineer on project: Chinichi Engineering

Beaux Vue Drainage Improvements
Engineer on project: Digital Engineering

THANK YOU

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